

Ergonomics in Action Tech Guide 220



Chapter 5: Education and Training



EDUCATION AND TRAINING OVERVIEW

The goal of ergonomics in the workplace is to prevent work-related injuries and illnesses, or WMSDs, by reducing or eliminating worker exposures to occupational hazards. An informed and properly trained workforce reduces the number of workers developing WMSDs, reduces workers' compensation costs, and improves productivity, quality of work, safety, and worker satisfaction.

Initiate Education and Training

The ergonomics subcommittee initiates routine education and training for all military and civilian personnel as they enter the workforce, as they change jobs or tasks, and as regular refresher training.

The ergonomics subcommittee initiates special training for its core members, action team members, and the installation ergonomics officer. Table 5-1 provides a more in-depth look at the specific levels of training and lists the goals for each level.

- There are three additional entry points to education and training:
- If the ergonomics subcommittee finds evidence of a potential problem area, or even one WMSD, during worksite analysis, they initiate education and training for all employees who work in the area, including job-specific training for high-risk tasks. Algorithm 2 in chapter 2 details the worksite analysis process.
 - If, as a result of worksite analysis, the workplace or an employee’s task changed, and interventions are implemented, the ergonomics subcommittee initiates education and training, including an overview of the intervention(s). Algortithm 3 in chapter 3 details the hazard prevention and control process.
 - If the health care provider finds evidence of a WMSD, and a returned to work plan is implemented for an employee, the ergonomics subcommittee initiates education and training for that employee, including an overview of an intervention being implemented. Algorithm 4 in chapter 4 details the health care aspect of the ergonomics program.



Test for Success

To measure the success of any education and training, the ergonomics subcommittee tests personnel at the conclusion of their training session to determine if they retained enough knowledge to appropriately modify their behavior in the workplace.

- If yes, then the ergonomics subcommittee files appropriate reports, with copies furnished to management and the employee and continues routine education and training on an as-needed basis, including refresher training.
- If no, then the ergonomics subcommittee must review the case and provide retraining through self-study or computer-based ‘ activities.

Workers should also be surveyed at the end of each training session about their job or work area and any body part discomfort they may be experiencing. This information will help determine problematic job series and work areas, and will help assess the effect of any implemented interventions.

What is the Role of Ergonomics Education and Training?

Education and training are the foundation of a successful ergonomics program. All other elements of the program are destined to fail if not built upon a solid foundation of ergonomics education and training. Effective training programs can also help create a sweeping culture change within your organization, with front-line workers identifying and resolving many of the work conditions that can lead to WMSDs.

Your installation must initiate a training program once a WMSD has been identified; however, proactive training can help stop injuries before they occur. The basic role of training and educations is to inform employees and service members about the ergonomic hazards that they may be exposed to in the workplace so they can actively participate in their own protection.



Table 1 outlines the individuals and groups who require training under an installation’s ergonomics plan. The table also establishes goals for each training level.

This chapter discusses the role of ergonomics education and training; outlines four levels of training and lists the goals for each level; and describes the “train the trainer” concept as it applies to the DoD’s ergonomics program.

Training for All Personnel

All military and civilian personnel should receive general information on the installation’s ergonomics program and plans. In addition to the goals for general training established in table 1, trainers should:

- Include job-specific training and identify the workplace risk factors present in that specific job and the control measures used to deal with the risk factors.
- Emphasize personal responsibility and encourage employees to take action by adjusting their work areas to suit their own needs and by changing their personal habits to prevent discomfort and injury.

In addition, workers should be observed on the job to evaluate the effectiveness of the training program. The observation should reflect the goals established in table 1. Results of the evaluations should be recorded and, if necessary, the training program should be modified.

Training for New and Reassigned Personnel

New and reassigned military and civilian personnel who are potentially exposed to WMSDs will receive an initial orientation and hands-on training from trained ergonomics personnel and the immediate supervisor prior to being placed in a fullproduction position. The initial orientation will include:

- A demonstration of the proper use and care of , and proper operating procedures for, all tools and equipment.
- Use of safety equipment.
- Use of safe and proper work procedures, such as proper lifting techniques.



Training for Personnel Who Administer the Ergonomics Program

Personnel responsible for administering the installation ergonomics program—namely the IEO and the ergonomics subcommittee—should receive special training so they may actively and successfully participate in the installation ergonomics effort.

Minimum acceptable training for personnel responsible for administering the ergonomics program is the basic 40-hour ergonomics course offered by USACHHPM or equivalent civilian training.

At the conclusion of each level of training for ergonomics personnel, trainers should use a combination of tests and hands-on tasks to evaluate the effectiveness of the training. The tests should cover material presented in the sessions and the tasks should involve demonstration of assessment skills and intervention planning. A site survey exercise is recommended during the advanced course. This experience requires the synthesis and application of presented material. The survey also increases confidence and the probability these skills will be used after completion of the training.

The goal of ergonomics in the workplace is to prevent WMSDs by reduing or eliminating worker exposures to occupational hazards. An informed and properly trained workforce reduces the number of workers developing WMSDs; reduces workers’ compensation costs; and improves productivity, quality of work, safety, and worker satisfaction.

Chapter 3 describes the available intervention methods and presents common problems and solutions regarding the design of workstations, reach distances, clearances, tools, and equipment.

Figure 1 presents USA-CHPPM’s basic course schedule.

Figure 2 presents a sample site survey. In this survey, ergonomists analyze a worksite after a worker is diagnosed with carpal tunnel syndrome.

Chapter 1 details the symptoms and occupational factors associated with carpal tunnel syndrome. Chapter 2 details the worksite analysis process.

Table 1. Suggested Training Levels			
Level	Audience	Goals	Content
One	General Includes employees and supervisors	<ul style="list-style-type: none">· Understand the variety of WMSDs and their symptoms, including basic anatomy and diseases of upper limb and back and the concept of cumulative injuries.· Recognize and report early symptoms and understand the necessity of proper work methods.· Know the causes of WMSDs, such as workplace stressors.· Understand basic ergonomics principles and be able to apply them in the prevention and control of injuries.· Recognize the workplace risk factors for WMSDs and know how to resolve basic problems.	
Two (1)	Ergonomics Subcommittee Specific to core members, support and advisory members, and installation-level personnel who provide assistance in recognizing WMSDs (e.g., worker groups)	Level One training plus: <ul style="list-style-type: none">· Support action team members with their outcomes.· Understand basic principles of passive and active surveillance.· Understand basic hazard prevention and control principles for WMSDs.· Understand individual subcommittee member's role/ contribution relative to the ergonomics program.	
Two (2)	Ergonomics Subcommittee Specific to action team members and IH/safety/medical personnel (e.g., job evaluators)	Level One and Level Two (1) training plus: <ul style="list-style-type: none">· Conduct passive and active surveillance including indepth workplace assessment.· Resolve problems and recommend workstation/task/tool changes to reduce or eliminate hazard/risk.· Conduct general training sessions on ergonomics, workstation design, and WMSDs.· Keep accurate records of identified WMSDs and solutions.	

Table 1. Suggested Training Levels			
Level	Audience	Goals	Content
Three	Trained ergonomics personnel Level One and Level Two (1) training plus:	<ul style="list-style-type: none">· Should possess a minimum of 40 hours of formal ergonomics training. (2)· Should be knowledgeable about ergonomics resources.	
Four	Installation ergonomics officer Level One, Level Two, Level	Three training plus: <ul style="list-style-type: none">· Should be knowledgeable about the processes and activities required for ergonomics program management.	



- 1 New and reassigned military and civilian personnel who are potentially exposed to WMSDs will receive an initial orientation and hands-on training from their immediate supervisors and trained ergonomics personnel prior to being placed in a full-production position. The initial orientation will include a demonstration of the proper use and care of, and the proper operating procedures for, all tools and equipment; proper use of safety equipment; and use of safe and proper work procedures such as proper lifting techniques.
- 2 Formal training is defined as classroom instruction, exercises, supervised worksite assessment, and individual training assignments.

Training Schedule					
	Monday	Tuesday	Wednesday	Thursday	Friday
0800	Course plan, introductions, Installation problem areas, current program status and Quiz	Quiz 0800-0815 Workplace Design	Quiz 0800-0815 Lifting and MMH, Product Evaluation, and Back Belts	Quiz 0800-0815 Selling Ergnomics Train the Trainer Resources Quiz 0800-0815	Final presentations and Executive summary
0900	Introduction to Ergonomics	Administrative Controls	Lifting Assessment Tools	Survey Specific: Conducting a Survey, Data, Survey Forms, and Group Project Practical Exercise I:View and analyze videotaped case study with assistance.	
1000	 Anthropometrics	Office Ergnomics	Practical Exercise	Practical Exercise II:View and analyze videotaped case study unassisted	
1100				Videotaping and Game Planning Course Wrap-up.	Certificates, awards and Course evaluations
1200	Lunch break	Lunch break	Lunch break	Lunch break	
1300	Upper Extremity Work-Related Musculoskeletal Disorders	Biomechanics	DOD/DA Policies Program Resources and Tools	Group project: site analysis: Passive and active surveillance, work area assessment, results	
1400	Saving Your Back - Lower Extremity (opt) - Neck (opt) Work-Related Musculoskeletal Disorders	Hand Tools	Task Analysis	Results analysis, problem identification and recommendations. Prepare executive summary and briefing.	
1500	Product Evaluation: Snake-Oil Salesmanship	Ergonomic Success Stories: Navy and OSHA	Risk Assement Codes and LSTAT		
1600	Quiz Make-up	Quiz Make-up	Quiz Make-up	Quiz Make-up	

Figure 2. Sample Site Survey
Ergonomic Evaluation of an Office Workstation at Fort Detrick, Maryland

WMSD Diagnosis. Ms. Sue Jones was diagnosed with carpal tunnel syndrome (CTS) in both wrists and currently wears a splint on her right wrist. She works three days a week at Fort Detrick and two days a week at USACHPPM. Ms. Jones has been doing computer-related work, including keyboarding and mouse work, for the past 10 years.

Request for Worksite Evaluation. MAJ Sanders, Chief, FPMTD, requested an ergonomic evaluation be performed on Ms. Jones’s office workstation at Fort Detrick (since her USACHPPM office was moving at the time, her workstation at that location was not evaluated).

Purpose. The purpose of the evaluation was to determine whether the current workstation design could lead to a WMSD.

Ergonomics Team. On 15 February 1996, an ergonomics team performed the evaluation. The team consisted of ergonomists Ms. Cathy Wen and Mr. Steve Chervak, both of Program 88, Ergonomics.

Results of Workstation/Job Evaluation. The evaluation of Ms. Jones’s workstation indicated that she was exposed to WMSD risk factors while performing normal job duties. Here are the risk factors observed on the job:

- Nonneutral postures in the upper extremities (which are known to increase the risk of WMSD injury). The primary cause of this posture was the workstation equipment which force Ms. Jones to alter her work practices, thereby putting stresses on her upper extremities.
- Awkward wrist position. Awkward wrist position is a primary factor in the development of CTS. Most standard keyboards force the worker to angle the hands in a nonneutral posture in order to type. When the wrist is in a nonneutral posture, pressure generated in the carpal tunnel compresses the median nerve, resulting in motor weakness and loss of sensation and coordination.
- Highly repetitive tasks. To perform her normal job duties, Ms. Jones spends about 30 hours per week using the keyboard and mouse. She reported typing between 80 and 100 words per minute. Highly repetitive tasks are common sources of risk for WMSDs even when the required forces are minimal.
- Static Posture. Ms. Jones’s current workstation design requires her to support the weight of her arms in front of her body in a static posture. Over long periods of time, the muscles in her shoulders, arms, and back tire, causing discomfort and pain and increasing the risk for injury.
- Nonadjustable table height. To improve Ms. Jones’s working posture, the ergonomics team raised the height of her chair. However, her feet no longer reached the floor after this adjustment. When the feet are not firmly supported, mechanical compression behind the knees decreased blood flow in the legs.
- Risk factors outside of work. Ms. Jones drives 45 minutes each way to Fort Detrick in a car with a standard shift. The force exerted while gripping the steering wheel and shifting gears increases the likelihood of a WMSD.

Figure 2. Sample Site Survey Continued

Recommendations of the Ergonomics Team

After carefully evaluating the Ms. Jones’s workstation and job tasks, the ergonomic team came up with the following recommendations:

Engineering controls. Engineering controls will help improve the quality of Ms. Jones’s office workstation. Such controls, or changes in the workstation design, are the preferred method of reducing the risk of WMSD injuries at workstations because they offer permanent solutions to problems. On average, engineering controls are 70 to 90 percent effective.

New equipment. New equipment will help Ms. Jones’s keep her upper extremities in neutral postures and reduce the stress to her body. A keyboard with an angled surface position will reduce hand deviations and wrist bending during keyboarding tasks. A mouse that better conforms to the shape of the hand will improve comfort while Ms. Jones performs searches on the computer. A wrist rest with arm/elbow supports will provide extra support where needed. A foot rest will relieve pressure in the thighs and provide the necessary support for the legs and feet.

Repositioning equipment. Locate the keyboard and mouse so that the elbows are as close to the body as possible, maintained at a 90 degree angle. In this position, the arms and shoulders are in neutral posture. Placement of the mouse should be next to the keyboard to minimize reach distances between the two components.

Discontinue use of wrist splint. Currently, Ms. Jones uses a wrist splint while performing normal job duties. The ergonomists recommended that Ms. Jones’s refrain from wearing the splint while performing tasks such as keyboarding or mouse work because the wrist must work harder to position itself to perform the task. Research has shown that the wrist works against the splint, increasing tendon activity and pressure in the carpal tunnel. Therefore, its use during work actually increases the risk for a WMSD.

Administrative controls. The ergonomic team recommended the following administrative control measures to improve Ms. Jones’s comfort and productivity:

Allow adequate rest breaks. Breaks in a work schedule are important because they minimize exposure to the physical stressors of a task. Breaks can release tension and allow time for muscles to recover. In general, a 5 to 10 minute stretching break for every hour of typing is recommended. Such breaks, taken at the worker’s discretion, have been found to be effective in reducing WMSD risk, without reducing productivity. The ergonomics team can provide recommendations on specific exercises.

Provide training. Provide training to educate workers about neutral body postures and the risk factors associated with WMSDs: posture, force, repetition, mechanical stress, vibration, and temperature.

THE TRAINERS

Who Should Teach Ergonomics?

Only trained ergonomics personnel should teach ergonomics, including health care, industrial hygiene, environmental science, safety, or engineering personnel with training in approved ergonomics courses. Suitable health care personnel should conduct the specific health-related portions of the training.

The “Train the Trainer” Concept. Getting the word out on any issue is difficult. Ergonomics is no different. The training is extensive and ergonomics experts are spread thinly across many audiences at many locations.

The “train the trainer” concept allows ergonomics experts to work with a group of personnel and develop their ergonomics skills to a level where the group, now known as trained ergonomics personnel, can provide training at the installation level, including supervisors and front-line workers.

Trained ergonomics personnel may also train representatives from each department or division to serve as worker groups or special assistants, who can help Recognize and report worksite hazards before WMSDs occur.

